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EXAMINER

ALI, SYED J

ART UNIT

PAPER NUMBER

2195

DATE MAILED: 04/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/934,443	LANDMAN ET AL.	
	Examiner	Art Unit	
	Syed J. Ali	2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 9-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 9-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the amendment filed January 20, 2006. Claims 1-6 and 9-32 are presented for examination.

2. The text of those sections of Title 35, U.S. code not included in this office action can be found in a prior office action.

Claim Rejections - 35 USC § 102

3. **Claims 1-6, 9-15, 17-19, 21-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Blelloch et al. (USPN 5,768,594) (hereinafter Blelloch).**

4. As per claim 1, Blelloch teaches the invention as claimed, including an apparatus, implemented in a computer-readable medium, for subdividing input data associated with a software program and processing each subdivided input data on one or more processing elements, comprising:

a non-threaded initiating program (col. 2 lines 14-27);

one or more non-threaded processing programs (col. 2 lines 57-63), wherein each of the one or more non-threaded processing programs are substantially identical (Fig. 3; col. 2 lines 37-43) and perform the same functions or operations as remaining ones of the one or more non-threaded processing programs (col. 2 lines 37-43; col. 5 lines 15-29; col. 6 lines 20-28), wherein substantially identical indicates that optional and minor configuration differences may exist (col. 2 lines 37-46); and

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a wrapper that intercepts a call to the initiating program and operable to subdivide input parameters into one or more job quanta (col. 3 lines 13-19), wherein each job quantum is submitted for execution to a separate processing program selected from the one or more processing programs residing on a separate processing element (col. 5 lines 15-30).

5. As per claim 2, Blleloch teaches the invention as claimed, including the apparatus of claim 1, wherein the wrapper assembles one or more output data from each processing program to form a single results data (col. 2 lines 44-46; col. 2 line 64 - col. 3 line 5).

6. As per claim 3, Blleloch teaches the invention as claimed, including the apparatus of claim 1, wherein each job quantum is provided to a separate job scheduler residing on each of the processing elements, each scheduler manages the execution of the processing program executing on the processing element (col. 2 lines 57-63).

7. As per claim 4, Blleloch teaches the invention as claimed, including the apparatus of claim 1, further comprising:

one or more additional wrappers, each additional wrapper residing on a single processing element and is operable to intercept the job quantum submitted to the processing program residing on the processing element (col. 2 lines 57-63; col. 3 lines 20-38).

8. As per claim 5, Blleloch teaches the invention as claimed, including the apparatus of claim 1, wherein the initiating program and each of the processing programs perform one or more operations that are substantially identical (col. 2 lines 28-43).

9. As per claim 6, Blleloch teaches the invention as claimed, including the apparatus of claim 5, wherein the operations are bioinformatic calculations (col. 2 lines 14-27).

10. As per claim 9, Blleloch teaches the invention as claimed, including the apparatus of claim 1, wherein at least one of the processing elements resides in a disparate processing environment from the initiating program (col. 2 lines 28-37).

11. As per claim 10, Blleloch teaches the invention as claimed, including the apparatus of claim 1, wherein the input parameters are normalized prior to being subdivided into the job quanta (col. 2 lines 14-27).

12. As per claim 11, Blleloch teaches the invention as claimed, including a method of processing a non-threaded set of executable instructions, comprising:

receiving input data associated with a call to a first non-threaded set of executable instructions (col. 2 lines 14-27; col. 3 lines 13-19);

parsing the input data into a plurality of job quanta, each job quantum operable to be independently processed by the first non-threaded set of executable instructions (col. 3 lines 13-19); and

submitting at least one job quantum for execution to a second non-threaded set of executable instructions, wherein the second non-threaded set of executable instructions is substantially identical to the first non-threaded set of executable instructions (col. 2 lines 28-43; col. 5 lines 15-30) and performs the same functions as the first non-threaded set of executable instructions (col. 2 lines 37-43; col. 5 lines 15-29; col. 6 lines 20-28), wherein the second set of executable instructions resides on one or more different processing elements from the first non-threaded set of executable instructions (col. 2 lines 28-37), and wherein substantially identical indicates that minor configuration differences may exist (col. 2 lines 37-46).

13. As per claim 12, Blelloch teaches the invention as claimed, including the method of claim 11, further comprising:

assembling an output data associated with the results of the execution of the second non-threaded set of executable instructions for a presentation (col. 2 lines 44-46; col. 2 line 64 - col. 3 line 5).

14. As per claim 13, Blelloch teaches the invention as claimed, including the method of claim 11, further comprising:

submitting at least one job quantum for execution to the first non-threaded set of executable instructions (col. 5 lines 15-30).

15. As per claim 14, Blelloch teaches the invention as claimed, including the method of claim 13, wherein the executions occur in parallel (col. 2 lines 14-27).

16. As per claim 15, Blelloch teaches the invention as claimed, including a job quanta data structure implemented in a computer-readable medium, comprising:

a first data (col. 3 lines 13-19; Fig. 1);

a second data wherein the first and second data are to be delineated and independently submitted as input parameter data used for execution by a separate non-threaded sets of executable instructions and processed in parallel on different processing elements (col. 3 lines 13-19; Fig. 1), wherein each separate non-threaded set of executable instructions is substantially identical (Fig. 3; col. 2 lines 37-43) and performs the same functions as remaining ones of the non-threaded sets of executable instructions (col. 2 lines 37-43; col. 5 lines 15-29; col. 6 lines 20-28), wherein substantially identical indicates that minor configuration differences may exist (col. 2 lines 37-46).

17. As per claim 17, Blelloch teaches the invention as claimed, including the job quanta of claim 15, wherein the first and second data are initially submitted as input parameter data to a single non-threaded set of executable instructions (col. 2 lines 14-27).

18. As per claim 18, Blelloch teaches the invention as claimed, including a system, implemented in a computer-readable medium, for performing parallel processing on a call to execute a software program, comprising:

means for intercepting a call to the software program, which is non-threaded (col. 2 lines 14-27; col. 3 lines 13-19);

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means for dividing a set of input data into a plurality of job quanta including a first job quantum and a second job quantum (col. 3 lines 13-19);

means for submitting the first job quantum to the software program and for submitting the second job quantum to a separate software program (col. 3 lines 13-19), wherein the software program and the separate software program are substantially identical to one another (Fig. 3; col. 2 lines 37-43) and perform the same functions as one another (col. 2 lines 37-43; col. 5 lines 15-29; col. 6 lines 20-28), wherein substantially identical indicates that minor configuration differences may exist (col. 2 lines 37-46); and

means for executing the software program and the separate software programs substantially in parallel (col. 2 lines 14-27).

19. As per claim 19, Blelloch teaches the invention as claimed, including the system of claim 18, further comprising:

means for assembling output data associated with the execution of the software program and at least one of the separate software programs into a presentation data (col. 2 lines 44-46; col. 2 line 64 - col. 3 line 5).

20. As per claim 21, Blelloch teaches the invention as claimed, including a method of processing a software program, comprising:

receiving input data associated with a call to the software program, which is non-threaded (col. 2 lines 14-27; col. 3 lines 13-19);

parsing the input data into a plurality of job quanta, each job quantum operable to be independently processed by the software program (col. 3 lines 13-19); and

submitting at least one job quantum for execution to a replica software program that is substantially identical to the software program (col. 2 lines 28-43; col. 5 lines 15-30) and which performs the same functions as the software program (col. 2 lines 37-43; col. 5 lines 15-29; col. 6 lines 20-28), wherein the replica software program resides on one or more different processing elements from the software program (col. 2 lines 28-37), and wherein substantially identical indicates that minor configuration differences may exist (col. 2 lines 37-46).

21. As per claim 22, Blleloch teaches the invention as claimed, including an information handling system, comprising:

a network (col. 2 lines 47-56);

a plurality of processing elements (col. 2 lines 47-56);

memory operatively coupled to the processing elements (col. 2 lines 47-56); and

means for wrapping a call to an application program by dividing input data among the processing elements for execution according to the non-threaded application program (col. 3 lines 13-19; col. 5 lines 15-30) and recombining output data from the processing elements (col. 2 lines 44-46; col. 2 line 64 - col. 3 line 5), wherein each processing element includes a duplicate instance of a same non-threaded application (Fig. 3; col. 2 lines 37-43) and wherein duplicate instances of the same non-threaded application receive a different portion of the divided input data (col. 2 lines 37-43; col. 5 lines 15-29; col. 6 lines 20-28).

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22. As per claim 23, Blelloch teaches the invention as claimed, including a method of processing a set of executable instructions, comprising:

receiving input data associated with a call to the set of executable instructions, which are non-threaded (col. 2 lines 14-27; col. 3 lines 13-19);

separating the input data into a plurality of job quanta, wherein each job quantum is operable to be independently processed by the set of executable instructions (col. 3 lines 13-19);
and

submitting at least one job quantum for execution to a substantial copy of the set of executable instructions, wherein the substantial copy performs the same functions as the set of executable instructions (col. 2 lines 37-43; col. 5 lines 15-29; col. 6 lines 20-28), and submitting a different job quantum to the set of executable instructions (col. 2 lines 28-43; col. 5 lines 15-30), wherein the substantial copy of the set of executable instructions and the set of executable instructions reside on different processing elements (col. 2 lines 28-37), and wherein a substantial copy indicates that minor configuration differences may exist between copies (col. 2 lines 37-46)..

23. As per claim 24, Blelloch teaches the invention as claimed, including the method of claim 23, further comprising assembling output data from the execution of the substantial copy of the set of executable instructions and from the set of executable instructions into a single presentation data (col. 2 lines 44-46; col. 2 line 64 - col. 3 line 5).

24. As per claim 25, Blleloch teaches the invention as claimed, including the method of claim 23, further comprising executing the substantial copy of the set of executable instructions and the set of executable instructions substantially in parallel (col. 2 lines 14-27).

25. As per claim 26, Blleloch teaches the invention as claimed, including the method of claim 23, wherein in separating the input data, the input data is separated into the plurality of job quanta by a wrapper associated with the set of executable instructions (col. 3 lines 13-19).

26. As per claim 27, Blleloch teaches the invention as claimed, including a parallel processing system, comprising:

a first software program having a wrapper operable to intercept calls made to the first software program (col. 2 lines 14-27; col. 3 lines 13-19), wherein the first software program resides on one or more first processing elements and is non-threaded (col. 2 lines 28-37);

a second software program which is a substantial copy of the first software program, which performs the same functions as the first software program and which is non-threaded (col. 2 lines 37-43; col. 5 lines 15-29; col. 6 lines 20-28), wherein the second software program resides on one or more second processing elements (col. 2 lines 28-37), and wherein the substantial copy indicates that minor configuration differences may exist (col. 2 lines 37-46); and

wherein the wrapper intercepts the calls and parses input data associated with the calls into job quanta, the job quanta includes a first job quantum and a second job quantum (col. 3 lines 13-19; col. 5 lines 15-30), and the first job quantum is submitted to the first software program for processing and the second job quantum is submitted to the second software program for processing substantially in parallel (col. 2 lines 14-27).

27. As per claim 28, Blelloch teaches the invention as claimed, including the system of claim 27, wherein the wrapper assembles output results associated with the processing of the first job quantum and the second job quantum (col. 2 lines 44-46; col. 2 line 64 - col. 3 line 5).

28. As per claim 29, Blelloch teaches the invention as claimed, including the system of claim 27, wherein one or more of the first processing are different from one or more of the second processing elements (col. 2 lines 28-37).

29. As per claim 30, Blelloch teaches the invention as claimed, including a parallel processing system, comprising:

a wrapper that intercepts calls to non-threaded software programs (col. 2 lines 14-27; col. 3 lines 13-19), wherein the software programs are substantial copies of each other and performs the same functions as each other (col. 2 lines 37-43; col. 5 lines 15-29; col. 6 lines 20-28) and which reside on different processing elements (col. 2 lines 28-43; col. 2 lines 28-37), and wherein the wrapper separates input data associated with the calls into a plurality of independent job quanta (col. 3 lines 13-19), and wherein the substantial copies indicates that minor configuration differences may exist between copies (col. 2 lines 37-46).; and

a scheduler that receives the plurality of job quanta from the wrapper and submits substantially in parallel different job quantum associated with the job quanta to a number of the software programs for processing (col. 2 lines 14-27; col. 3 lines 13-19), wherein the scheduler selects the number of the software programs based on processing loads associated with the number of software programs (col. 3 lines 20-30).

30. As per claim 31, Blelloch teaches the invention as claimed, including the system of claim 30, wherein the wrapper assembles results associated with processing the different job quantum for a unified presentation (col. 2 lines 44-46; col. 2 line 64 - col. 3 line 5).

Claim Rejections - 35 USC § 103

31. **Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blelloch in view of Shah et al. (US 2002/0035556) (hereinafter Shah).**

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32. As per claim 16, Shah teaches the invention as claimed, including the job quanta of claim 15, wherein the first and second data are delineated using extensible markup language (paragraph 0076).

33. It would have been obvious to one of ordinary skill in the art to combine Blelloch and Shah since the distribution of processing across multiple machines may include distributing processing to machines that are incompatible. XML provides a format that is platform independent and allows specific custom functionality to be provided, thereby making it a highly desirable format for encapsulating data that is to be distributed amongst a diverse group of machines.

34. Claims 20 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blelloch in view of Klein (USPN 6,185,590).

35. As per claim 20, Klein teaches the invention as claimed, including the system of claim 19, further comprising:

means for trapping and reporting error conditions generated by the execution of the software program and at least one of the separate software programs (col. 6 lines 7-11).

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36. It would have been obvious to one of ordinary skill in the art to combine Blelloch and Klein for the purpose of protecting against improper engine functioning and providing a method of handling errors. When distributing processing across multiple computers to compute a shared result, one processing element's failure would lead to a total failure in the corresponding output. Encapsulating a way of identifying errors makes it so that one processing element's failure is not propagated to all the other processing elements' output as well.

37. As per claim 32, Klein teaches the invention as claimed, including the system of claim 30, wherein the scheduler traps any errors associated with processing the different job quantum and reports the errors to the wrapper (col. 6 lines 7-11).

Response to Arguments

38. **Applicants' arguments filed January 20, 2006 have been fully considered but they are not persuasive.**

39. Applicants argue that Blelloch is fundamentally different from the claimed invention, in that "*Blelloch teaches breaking discrete and different tasks of a sequential program up and parallel processing some of them that can be processed in parallel.*" Applicants assert that this is a fundamental distinction from the claimed invention, for which it is alleged that "*the same functions [are] processed in parallel.*"

40. Applicants arguments center entirely on the allegation that the claimed invention executes the same tasks in parallel, i.e. the claimed "processing programs" are "substantially

identical” and perform “the same functions and operations.” Examiner respectfully submits that there is no need to show Blleloch processing “the same tasks” in parallel since the claimed invention is not directed to such an arrangement. Applicants equate the subdivided input data of the initiating program and the processing elements, which is a mischaracterization of the claimed invention. For instance, at pages 7-8 of Applicants’ specification, the initiating program is subdivided and submitted to the various processing programs. The claimed invention indicates that the “processing programs,” i.e. the processing elements (PEs) of Blleloch, are substantially identical. There is little doubt that the processing elements of Blleloch are substantially identical, as shown in Figs. 2 and 3.

Moreover, Applicants’ assertion that “Blleloch teaches breaking discrete and different tasks of a sequential program up and parallel processing some of them” is quite correct, and mirrors the claim language. It is not clear how, if at all, Blleloch can be distinguished from the claimed invention once this is pointed out. That is, by “breaking discrete and different tasks of a sequential program up,” Blleloch is “subdivid[ing] input parameters into one or more job quanta.” By then “parallel processing some of them,” Blleloch is “submitt[ing each job quantum] for execution to a separate processing program selected from the one or more processing programs residing on a separate processing element.” The details of how processing progresses in each processing element is described in Figs. 2, 2A, and 3 and at col. 2 line 37 - col. 3 line 12. Each processing element is identical and contains identical programs for processing tasks, as claimed.

Conclusion

41. **THIS ACTION IS MADE FINAL.** Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J. Ali whose telephone number is (571) 272-3769. The examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai T. An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Syed Ali
March 31, 2006


SUPERVISOR PATENT EXAMINER
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